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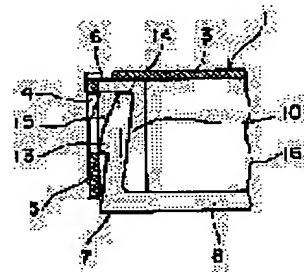
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(54) LIQUID CRYSTAL DISPLAY DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To facilitate the assembly and to make repair and replacement easy by fitting a projection part of a fitting arm part with elasticity in a recessed part and boring holes in a front plate and a rear plate opposite an end part of the fitting arm part.

SOLUTION: A liquid crystal display body 16 is put in a back frame body 7 and a front frame part 1 is put on it and then pressed in. Then the lower end part of a side plate 5 of the front frame body 1 abuts against a slanting part 15 of the fitting arm part 10 and is pressed in downward while making the fitting arm part 10 bend inwardly, and when the lower end of the projection part 13 of the fitting arm part 10 meets the recessed part 4, the projection part 13 is fitted in the recessed part 13 by the elasticity of the fitting arm part 10 to engage it. At this time, an end surface 14 and a groove part 12 of the fitting arm part 10 face a hole 6 and the upper part of the slanting part 15 comes out of the recessed part 4; and the liquid crystal display body 16 is fitted by being clamped between a front plate 3 and a 2 rear plate 8.



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CLAIMS

[Claim(s)]

[Claim 1] It has the liquid crystal display object which is pinched with a front frame, a tooth-back frame, and said front frame and said tooth-back frame, and is attached. While preparing the mounting arm which has the spring nature which equipped the side plate of said front frame, or the side plate of said tooth-back frame with the heights which insert a crevice in said crevice in another side again The liquid crystal display characterized by having countered said end face and preparing a hole in the front plate of said front frame which counters the end face of this mounting arm, or the tooth-back plate of said tooth-back frame.

[Claim 2] Said mounting arm is a liquid crystal display according to claim 1 characterized by considering as the configuration equipped with the slot which counters said hole between said two heights.

[Claim 3] The liquid crystal display according to claim 2 characterized by having formed said tooth-back frame with synthetic resin, and preparing said two or more mounting arms in this tooth-back frame.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention simplifies disassembly of a frame and relates to a liquid crystal display with easy repair of a liquid crystal display object and exchange.

[0002]

[Description of the Prior Art] As the liquid crystal display in the former is shown in drawing 6 and drawing 7, the tooth-back frame 35 of the cube type which the front frame 30 which consists of a metal plate consists of a front plate 32 which has opening 31, and a side plate 34 which has two or more mounting feet 33, and consists of synthetic resin consists of a tooth-back plate 36 and a side plate 38 which has two or more crevices 37. Moreover, although not illustrated here, the liquid crystal display object 39 with which the laminating of a liquid crystal display component, the printed circuit board for actuation, a transparent material, a reflecting plate, the diffusion plate, etc. is carried out, they are constituted, and change is contained by said tooth-back frame 35, and bends and stops said mounting foot 33 to said crevice 37, and with the tooth-back plate 36 of the tooth-back frame 35, and the front plate 32 of the front frame 30, the liquid crystal display object 39 is pinched and it is attached.

[0003] Since such a liquid crystal display is expensive, when the components which constitute the liquid crystal display object 39 produce failure or breakage, repair of components or exchange is performed. And in the former, when a problem is discovered by the liquid crystal display object 39 or failure and breakage arise in the activity way on it in the inspection process of a liquid crystal display, the bent mounting foot 33 is first bent and returned to the original condition, and the front frame 30 and the tooth-back frame 35 are disassembled. After performing ejection, repair of the components of the liquid crystal display object 39, and exchange for the liquid crystal display object 39 after an appropriate time, again, the liquid crystal display object 39 is contained to the tooth-back frame 35, and the front frame 30 is put, and the mounting foot 33 is bent and stopped to a crevice 37.

[0004]

[Problem(s) to be Solved by the Invention] Since it is what bends and stops the mounting foot 33 prepared in the side plate 34 of the front frame 30 to the crevice 37 of the tooth-back frame 35 in the conventional liquid crystal display, Assembly-operation nature is bad, the mounting foot 33 must be bent and returned to the original condition also in repair of the components of about [becoming cost high] and the liquid crystal display object 39, and exchange for disassembly of a frame, and there is a problem referred to as the decomposition being troublesome and taking time and effort. Moreover, the mounting foot 33 has further the problem of fatigue arising on mounting foot 33, and causing a crease and damaging in order to repeat bending for whenever [the / every], assembly, decomposition, and, with assembly.

[0005]

[Means for Solving the Problem] As 1st solution means for solving said technical problem, a front frame and a tooth-back frame, It has the liquid crystal display object which is pinched with said front frame and said tooth-back frame, and is attached. While preparing the mounting arm which has the spring nature which equipped the side plate of said front frame, or the side plate of said tooth-back frame with

the heights which insert a crevice in said crevice in another side again It considered as the configuration which countered said end face and prepared the hole in the front plate of said front frame which counters the end face of this mounting arm, or the tooth-back plate of said tooth-back frame. Moreover, said mounting arm was considered as the configuration equipped with the slot which counters said hole between said two heights as 2nd solution means. Furthermore, as 3rd solution means, said tooth-back frame was formed with synthetic resin, and it considered as the configuration which prepared said two or more mounting arms in this tooth-back frame.

[0006]

[Embodiment of the Invention] Companion a radical is explained to the example which showed the liquid crystal display in this invention to drawing 1 – drawing 5 . The front frame 1 which consists of a metal plate is equipped with the front plate 3 of the rectangle which has opening 2, the side plate 5 which has two or more crevices 4 which are caudad bent from the perimeter of this front plate 3, and consist of a hole, and two or more holes 6 prepared in the front plate 3 near said each crevice 4. Moreover, the box-like tooth-back frame 7 which consists of synthetic resin is equipped with the tooth-back plate 8, the side plate 9 prolonged in the upper part from the perimeter of this tooth-back plate 8, two or more mounting arms 10 with the spring nature formed in this side plate 9, and the slitting section 11 prepared in the both sides of the mounting arm 10 of a side plate 9.

[0007] And said mounting arm 10 has two heights 13 prepared in the both sides at the lateral part across the slot 12 formed in the vertical direction, and the ramp 15 which inclined in the end-face 14 side from the lower part, and was prepared in the top face of said heights 13. Moreover, these mounting arms 10 are formed corresponding to said crevice 4, heights 13 can be inserted in a crevice 4, and the end face 14 changes so that the hole 6 prepared in the front plate 3 of the front frame 1 may be countered.

[0008] Although the liquid crystal display object 16 is not illustrated here, the laminating of a liquid crystal display component, the printed circuit board for actuation, a transparent material, a reflecting plate, the diffusion plate, etc. is carried out one by one, and they are constituted. Moreover, this liquid crystal display object 16 While being contained by the cavernous section of the tooth-back frame 7, inserting the heights 13 of the mounting arm 10 in the crevice 4 of the front frame 1 and putting the front frame 1 and the tooth-back frame 7 together, the liquid crystal display object 16 is pinched with both the frames 1 and 7, and is attached. While being in the hole 6 and the opposite condition that the end face 14 of the mounting arm 10 and the slot 12 were established in the front plate 3 at this time, the upper part of a ramp 15 is in the condition of having escaped from the crevice 4 a little and having come out of it.

[0009] Next, first, if the assembly of a liquid crystal display is explained, as shown in drawing 3 , the liquid crystal display object 16 will be contained to the tooth-back frame 7, next the front frame 1 will be put from this upper part, and the front frame 1 will be pushed in in the direction of an arrow head. Then, as it is pushed in caudad, the soffit section of the side plate 5 of the front frame 1 contacting the ramp 15 of the mounting arm 10, and sagging the mounting arm 10 in the inner direction and the continuous line of drawing 4 shows the mounting arm 10, when the soffit of heights 13 will be in agreement with a crevice 4, as a dotted line shows heights 13 by the spring nature of the mounting arm 10, it inserts in a crevice 4 and stops. While the end face 14 of the mounting arm 10 and a slot 12 counter a hole 6 at this time, the upper part of a ramp 15 will be in the condition of having escaped from and come out from the crevice 4, and the liquid crystal display object 16 is pinched with the front plate 3 and the tooth-back plate 8, and is attached. Thus, the assembly of a liquid crystal display is completed.

[0010] Moreover, in the liquid crystal display assembled by doing in this way, when a problem is discovered by the liquid crystal display object 16 or failure and breakage arise in the activity way on it in an inspection process, as shown in drawing 5 , the head prepares first what attached two or more fixtures 17 of a wedge configuration in the holder (not shown) of a piece. And if each fixture 17 is simultaneously inserted in a hole 6 after making two or more fixtures 17 counter each hole 6 of the front frame 1 and arranging them, the mounting arm 10 will bend in the direction in which a slot 12 is made a

guide and engagement to a crevice 4 separates [heights 13] from the mounting arm 10 the inner direction, and a fixture 17 will extract the tooth-back frame 7 from the front frame 1 in the condition that engagement separated. If the front frame 1 is again put and stuffed into the tooth-back frame 7 as the liquid crystal display object 16 was contained and mentioned above in the tooth-back frame 7 after performing ejection, repair of the components of the liquid crystal display object 16, and exchange for the liquid crystal display object 16 from the tooth-back frame 7 after an appropriate time, the heights 13 of the mounting arm 10 will stop to a crevice 4, and both the frames 1 and 7 will come to combine. [0011] In said example, when the front frame 1 may be used for a tooth-back frame, and the tooth-back frame 7 may be used for a front frame and a frame is disassembled in this case, it is in the condition caudad located in the fixture 17, and comes to insert a fixture 17 in a hole 6.

[0012]

[Effect of the Invention] While fitting in and attaching in a crevice the heights of a mounting arm which have spring nature according to this invention In order to counter the edge of a mounting arm and to prepare a hole in a front plate or a tooth-back plate, mounting with a front frame and a tooth-back frame Assembly is possible only by entrapping both, the assembly is easy, productivity is good, and only by inserting a fixture in a hole, disassembly of both frames is attained and repair of the components of a liquid crystal display object and exchange become easy. Moreover, disassembly of nothing and a frame becomes [this slot] easy about the duty of the guide at the time of insertion of a fixture by preparing a slot between two heights. Furthermore, by preparing two or more mounting arms in a tooth-back frame, the top face of a liquid crystal display object is turned up, assembly in a normal condition and disassembly of a frame can be performed, and the activity can be done easy.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective view of the liquid crystal display of this invention.

[Drawing 2] The liquid crystal display of this invention is started and it is the amplification perspective view of the K section of drawing 1 .

[Drawing 3] The explanatory view in which starting the liquid crystal display of this invention and showing the assembly approach.

[Drawing 4] The explanatory view in which starting the liquid crystal display of this invention and showing the assembly approach.

[Drawing 5] The explanatory view in which starting the liquid crystal display of this invention and showing the decomposition approach.

[Drawing 6] The perspective view of the conventional liquid crystal display.

[Drawing 7] The important section sectional view of the conventional liquid crystal display.

[Description of Notations]

1 Front Frame

2 Opening

3 Front Plate

4 Crevice

5 Side Plate

6 Hole

7 Tooth-Back Frame

8 Tooth-Back Plate

9 Side Plate

10 Mounting Arm

11 Slitting Section

12 Slot

13 Heights

14 End Face

15 Ramp

16 Liquid Crystal Display Object

17 Fixture

[Translation done.]

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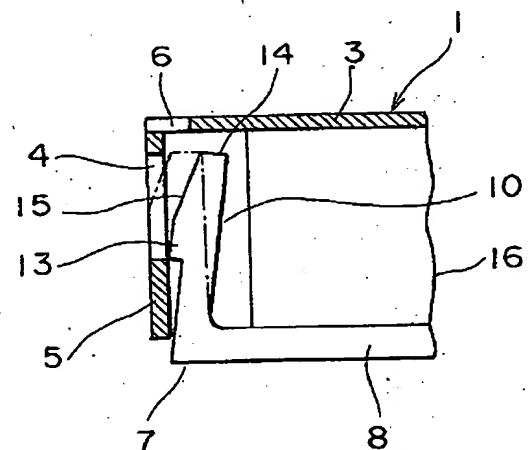
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(54) 【発明の名称】 液晶表示装置

(57) 【要約】

【課題】 従来の液晶表示装置においては、前面枠体の側板に設けた取付脚を、背面枠体の凹部に折り曲げ係止するものであるため、組立作業性が悪く、コスト高になるばかりか、液晶表示体の部品の修理、交換においても、枠体の分解のために、取付脚を元の状態に折り曲げて戻さねばならず、その分解作業が面倒で、手間が掛かると言う問題がある。

【解決手段】 本発明によれば、バネ性を有する取付腕部の凸部を凹部に嵌合して取り付けると共に、取付腕部の端部に対向して、前面板、又は背面板に孔を設けたものであるため、前面枠体と背面枠体との取付は、両者をはめ合わせるだけで組立が出来、その組立が簡単で生産性が良好で、また、孔に治具を差し込むだけで、両枠体の分解が可能となって、液晶表示体の部品の修理、交換が容易となる。



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【特許請求の範囲】

【請求項1】 前面枠体と、背面枠体と、前記前面枠体と前記背面枠体とで挟持されて取り付けられる液晶表示体とを備え、前記前面枠体の側板と前記背面枠体の側板の何れか一方には凹部を、また、他方には前記凹部に嵌入する凸部を備えたバネ性を有する取付腕部を設けると共に、該取付腕部の端面に対向する前記前面枠体の前面板、又は前記背面枠体の背面板に、前記端面に対向して孔を設けたことを特徴とする液晶表示装置。

【請求項2】 前記取付腕部は、二つの前記凸部間に、前記孔に対向する溝部を備えた構成としたことを特徴とする請求項1記載の液晶表示装置。

【請求項3】 前記背面枠体を合成樹脂で形成し、該背面枠体に複数の前記取付腕部を設けたことを特徴とする請求項2記載の液晶表示装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、枠体の分解を簡単にして、液晶表示体の修理、交換が容易な液晶表示装置に関する。

【0002】

【従来の技術】従来における液晶表示装置は、図6、図7に示すように、金属板から成る前面枠体30は、開口31を有する前面板32と、複数の取付脚33を有する側板34とで構成され、また、合成樹脂から成る箱形の背面枠体35は、背面板36と、複数の凹部37を有する側板38とで構成されている。また、ここでは図示しないが、液晶表示素子、駆動用プリント基板、導光体、反射板、拡散板等が積層されて構成されて成る液晶表示体39が、前記背面枠体35に収納され、前記取付脚33を前記凹部37に折り曲げ係止して、背面枠体35の背面板36と前面枠体30の前面板32とで液晶表示体39が挟持されて取り付けられている。

【0003】このような液晶表示装置は、高価なため、液晶表示体39を構成する部品が故障、或いは破損等を生じた時、部品の修理、又は交換が行なわれる。そして、従来においては、液晶表示装置の検査工程で液晶表示体39に問題が発見されたり、或いは使用用途において故障、破損が生じた時、先ず、折り曲げられた取付脚33を、元の状態に折り曲げて戻し、前面枠体30と背面枠体35とを分解する。しかる後、液晶表示体39を取り出し、液晶表示体39の部品の修理、交換を行った後、再度、液晶表示体39を背面枠体35に収納し、そして、前面枠体30を被せ、取付脚33を凹部37に折り曲げ係止するものである。

【0004】

【発明が解決しようとする課題】従来の液晶表示装置においては、前面枠体30の側板34に設けた取付脚33を、背面枠体35の凹部37に折り曲げ係止するものであるため、組立作業性が悪く、コスト高になるばかり

か、液晶表示体39の部品の修理、交換においても、枠体の分解のために、取付脚33を元の状態に折り曲げて戻さねばならず、その分解作業が面倒で、手間が掛かるという問題がある。また、取付脚33は、組立、分解、更に組立と、そのたび毎に折り曲げを繰り返すため、取付脚33に疲労が生じて折れを起こして破損するという問題がある。

【0005】

【課題を解決するための手段】前記課題を解決するための第1の解決手段として、前面枠体と、背面枠体と、前記前面枠体と前記背面枠体とで挟持されて取り付けられる液晶表示体とを備え、前記前面枠体の側板と前記背面枠体の側板の何れか一方には凹部を、また、他方には前記凹部に嵌入する凸部を備えたバネ性を有する取付腕部を設けると共に、該取付腕部の端面に対向する前記前面枠体の前面板、又は前記背面枠体の背面板に、前記端面に対向して孔を設けた構成とした。また、第2の解決手段として、前記取付腕部は、二つの前記凸部間に、前記孔に対向する溝部を備えた構成とした。更に、第3の解決手段として、前記背面枠体を合成樹脂で形成し、該背面枠体に複数の前記取付腕部を設けた構成とした。

【0006】

【発明の実施の形態】本発明における液晶表示装置を、図1～図5に示した実施例に基づきを説明する。金属板から成る前面枠体1は、開口2を有する矩形の前面板3と、該前面板3の周囲から下方に折り曲げられ、孔から成る複数の凹部4を有する側板5と、前記各凹部4の近傍の前面板3に設けられた複数の孔6とを備えている。また、合成樹脂から成る箱状の背面枠体7は、背面板8と、該背面板8の周囲から上方に延びる側板9と、該側板9に形成されたバネ性のある複数の取付腕部10と、側板9の取付腕部10の両側に設けられた切り込み部11とを備えている。

【0007】そして、前記取付腕部10は、外側部に、上下方向に形成された溝部12を挟んでその両側に設けられた二つの凸部13と、下方から端面14側に傾斜して、前記凸部13の上面に設けられた傾斜部15とを有している。また、これらの取付腕部10は、前記凹部4に対応して形成されており、凸部13は凹部4に嵌入可能で、また、端面14は、前面枠体1の前面板3に設けられた孔6に対向するように成っている。

【0008】また、液晶表示体16は、ここでは図示しないが、液晶表示素子、駆動用プリント基板、導光体、反射板、拡散板等が順次積層されて構成されており、この液晶表示体16は、背面枠体7の空洞部に収納され、取付腕部10の凸部13を前面枠体1の凹部4に嵌入して、前面枠体1と背面枠体7とが組み合わされると共に、液晶表示体16が両枠体1と7とで挟持されて取り付けられる。この時、取付腕部10の端面14、及び溝部12は前面板3に設けられた孔6と対向状態にあると

(3)

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共に、傾斜部15の上部は凹部4から若干抜け出した状態となっている。

【0009】次に、液晶表示装置の組立について説明すると、先ず、図3に示すように、液晶表示体16を背面枠体7に収納し、次に、この上方から前面枠体1を被せ、矢印方向に前面枠体1を押し込む。すると、前面枠体1の側板5の下端部が取付腕部10の傾斜部15に当接して、取付腕部10を内方に撓ませながら下方に押し込まれ、取付腕部10は図4の実線で示すように、凸部13の下端が凹部4に一致した状態になると、凸部13は取付腕部10のパネ性によって、点線で示すように凹部4に嵌入して係止する。この時、取付腕部10の端面14、及び溝部12は孔6に対向すると共に、傾斜部15の上部は、凹部4から抜け出した状態となり、且つ、液晶表示体16は、前面板3と背面板8とで挟持されて取り付けられる。このようにして、液晶表示装置の組立が完了する。

【0010】また、このようにして組み立てられた液晶表示装置において、検査工程で液晶表示体16に問題が発見されたり、或いは使用用途において故障、破損が生じた時、図5に示すように、先ず、先端がくさび形状の複数の治具17を、一個の保持具（図示せず）に取り付けたものを用意しておく。そして、複数の治具17を、前面枠体1の各孔6に対向させて配置した後、各治具17を同時に孔6に差し込むと、治具17は溝部12をガイドにして取付腕部10を内方、即ち、凸部13が凹部4との係合が外れる方向に取付腕部10が撓み、係合が外れた状態において、背面枠体7を前面枠体1から抜き出す。しかる後、背面枠体7から液晶表示体16を取り出し、液晶表示体16の部品の修理、交換を行った後、再度、液晶表示体16を背面枠体7に収納し、そして、前述したように、前面枠体1を背面枠体7に被せて、押し込むと、取付腕部10の凸部13が凹部4に係止して、両枠体1、7が組み合わさるようになる。

【0011】前記実施例において、前面枠体1を背面枠体に、また、背面枠体7を前面枠体に使用しても良く、この場合、枠体を分解するときは、治具17を下方に位置した状態で、孔6に治具17を差し込むようになる。

【0012】

【発明の効果】本発明によれば、パネ性を有する取付腕部の凸部を凹部に嵌合して取り付けると共に、取付腕部

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の端部に対向して、前面板、又は背面板に孔を設けたものであるため、前面枠体と背面枠体との取付は、両者をはめ合わせるだけで組立が出来、その組立が簡単で生産性が良好で、また、孔に治具を差し込むだけで、両枠体の分解が可能となって、液晶表示体の部品の修理、交換が容易となる。また、二つの凸部間に溝部を設けることによって、この溝部が治具の挿入時のガイドの役目をなし、枠体の分解が容易になる。更に、背面枠体に複数の取付腕部を設けることによって、液晶表示体の上面を上にして、正常な状態での組立、枠体の分解が出来、その作業を容易にすることができる。

【図面の簡単な説明】

【図1】本発明の液晶表示装置の斜視図。

【図2】本発明の液晶表示装置に係り、図1のK部の拡大斜視図。

【図3】本発明の液晶表示装置に係り、その組立方法を示す説明図。

【図4】本発明の液晶表示装置に係り、その組立方法を示す説明図。

【図5】本発明の液晶表示装置に係り、その分解方法を示す説明図。

【図6】従来の液晶表示装置の斜視図。

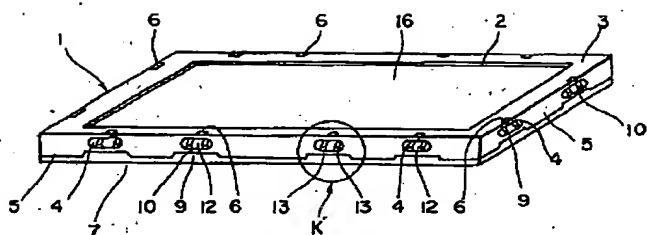
【図7】従来の液晶表示装置の要部断面図。

【符号の説明】

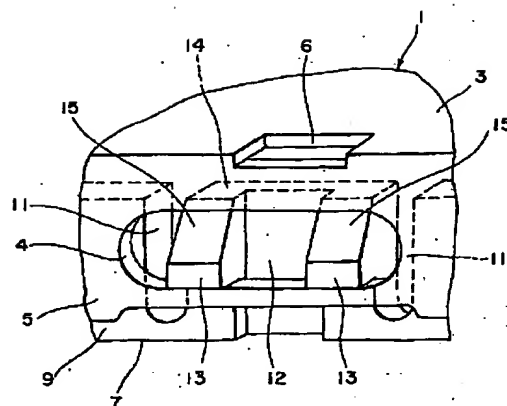
- 1 前面枠体
- 2 開口
- 3 前面板
- 4 凹部
- 5 側板
- 6 孔
- 7 背面枠体
- 8 背面板
- 9 側板
- 10 取付腕部
- 11 切り込み部
- 12 溝部
- 13 凸部
- 14 端面
- 15 傾斜部
- 16 液晶表示体
- 17 治具

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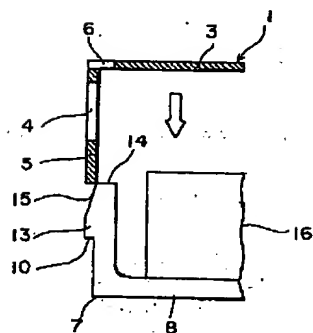
【図1】



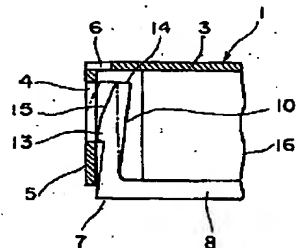
【図2】



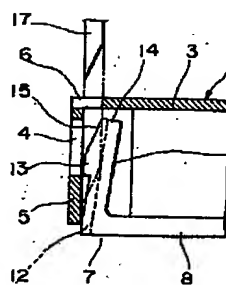
【図3】



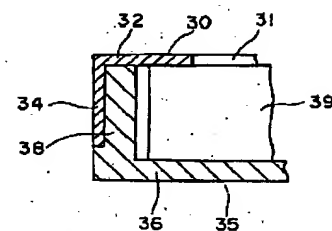
【図4】



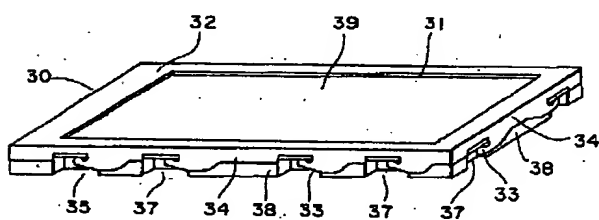
【図5】



【図7】



【図6】



フロントページの続き

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拒絶査定



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| 代理人 | 上柳 雅誉 (外 2名) |

J0005808

USO1 公開

この出願については、平成15年10月23日付け拒絶理由通知書に記載した理由によって、拒絶をすべきものである。

なお、意見書及び手続補正書の内容を検討したが、拒絶理由を覆すに足りる根拠が見いだせない。

備考

第1保持部材の係合部及び第2保持部材の係合部が相互に係合することによって電気光学パネルを挟持した状態で保持する構造は周知（例えば特開平10-206831号公報を参照）であり、該構造を引例1に付加し、補正後の請求項1-9に係る発明とすることは、単なる設計事項である。

J0006415

CA01 出願

USO1 公開

J0006468

CA01 出願

USO2 出願

J0006414

USO2 出願

J0006989

CA01 出願

J0007015

USO1 公開

J0007071

CA01 出願

USO1 公開

J0007070

CA01 出願

USO1 公開

上記はファイルに記録されている事項と相違ないことを認証する。

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